



STATEMENT OF BASIS

RANSOM ROAD LANDFILL SWMU #3 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION KENNEDY SPACE CENTER BREVARD COUNTY, FLORIDA



PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed to inform and give the public an opportunity to comment on a proposed remedy to address contamination at the Ransom Road Landfill¹. A Kennedy Space Center (KSC) Remediation Team consisting of National Aeronautics and Space Administration (NASA), United States Environmental Protection Agency (EPA), and Florida Department of Environmental Protection (FDEP) has determined that the proposed remedy is cost effective and protective of human health and the environment. However, prior to implementation of the proposed remedy, the KSC Remediation Team would like to give an opportunity for the public to comment on the proposed remedy. At any time during the public comment period, the public may comment as explained in the “How Do You Participate” section of this SB. After the end of the public comment period, the KSC Remediation Team will review all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy prior to implementation.

WHY IS A REMEDY NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation

(RFI) indicated that several volatile organic compounds (VOCs) listed in Table 1 are present in groundwater, which could be potentially harmful to human health if this water was used for human consumption now or in the future.

HOW DO YOU PARTICIPATE?

The KSC Remediation Team solicits public review and comment on this SB before implementing the proposed remedy. The remedy for the Ransom Road Landfill (RRLF) will eventually be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for Kennedy Space Center (KSC).

The Cleanup Remedy

The proposed cleanup remedy for the Ransom Road Landfill includes the following components:

- Natural attenuation of groundwater to remove contaminants through natural processes.
- Monitoring of groundwater to document water quality and contaminant levels.
- Implementation of institutional controls to prohibit the use of groundwater as a potable water supply.

1. In accordance with RCRA §7004(b), this Statement of Basis summarizes the proposed remedy for the NASA Ransom Road Landfill. For detailed information on the site, consult the Ransom Road Landfill RFI Addendum Report, which is available for review at the information repository located at the North Brevard Library, 2121 South Hopkins Avenue, Titusville, FL 32780, telephone: (321) 264-5026.

The public comment period for this SB and proposed remedy will begin on the date of publication for notice of availability of the SB in major local newspapers of general circulation and end 45 days thereafter. If requested during the comment period, the KSC Remediation Team will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or provide comments, contact the following person in writing within the 45-day comment period:

Mr. John Armstrong, P.G.
FDEP - Bureau of Waste Cleanup
2600 Blair Stone Road, MS 4535
Tallahassee, FL 32399-2400

The HSWA Permit, SB, and associated administrative file, including the RFI Report, will be available to the public for viewing and copying at:

NASA Document Library
North Brevard Library
2121 South Hopkins Avenue
Titusville, FL 32780
Telephone: (321) 264-5026

To request further information, you may contact one of the following people:

Mr. Harold Williams
Remediation Program Manager
Environmental Program Office
Mail Code: TA-C3
Kennedy Space Center, FL 32899
E-mail: Harold.G.Williams@nasa.gov
Telephone: (321) 867-8411

Mr. John Armstrong, P.G.
FDEP-Bureau of Waste Cleanup
2600 Blair Stone Road, MS 4535
Tallahassee, FL 32399-2400
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Telephone: (850) 245-8981

FACILITY DESCRIPTION

NASA established the KSC as the primary launch site for the space program. These operations have involved the use of toxic and hazardous materials. Under the RCRA and applicable HSWA permit (Permit No. FL6800014585) issued by the FDEP and/or EPA, KSC was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) No. 3, the Ransom Road Landfill.

SITE DESCRIPTION AND HISTORY

Ransom Road Landfill is located on the south side of Ransom Road, one mile south of the Visitors Center at KSC and approximately one mile west of Kennedy Parkway (Figure 1 and 2). The landfill is a closed facility that was operated by NASA during the initial construction of facilities at KSC from 1964 through 1970.

Landfilling activities included the excavation of trenches that had approximate dimensions of 600' x 30' x 10' deep. The trenches ran east to west in the southern portion of the site. The trenches were unlined, dug to below the water table, and received all waste types during its years of operation. The trenches were then filled with soils that were excavated from the site.

Groundwater sampling was initiated in 1984 and following a review of several sampling events the Florida Department of Environmental Regulation, currently the FDEP issued a Consent Order (OGC-Case No. 89-1206) that required corrective actions for groundwater. The requirements of this Consent Order have subsequently been incorporated into the HSWA portion Center's RCRA permit. The Consent Order was officially closed by the FDEP on July, 11, 2003. Investigations conducted at the site include:

- 1991: Interim corrective measures were implemented by constructing a cap over the former landfill. Capping included regrading and the construction of ditch plugs.

- 1993: RCRA Facility Investigation Work Plan was submitted to the USEPA and approved in 1994.
- 1994 - 1997: A RCRA Facility Investigation was conducted. Samples of groundwater, sediment, and surface water were collected and analyzed. Results of these analyses were used to determine human health and ecological risks. The Preliminary Risk Evaluation (PRE) for human health indicated that groundwater containing VOCs, would result in an unacceptable human health risk if the groundwater was used as a source of drinking water. The ecological risk assessment (ERA) indicated that no unacceptable risk exists at the site for ecological receptors.
- 1999 – 2000: Interim Monitoring of groundwater was implemented for VOC contamination. Based on the data it was determined that additional assessment was warranted in the southern portion of the site.
- 2001 – 2003: Interim Monitoring and RFI Addendum. Supplemental assessment delineated the horizontal and vertical extent of VOC contamination in the wooded area south of the landfill.

SUMMARY OF SITE RISK

As part of the RFI activities, risk assessments were completed in accordance with KSC's Remediation Team Risk Assessment Decision Process Document (DPD). The ecological risk assessment (ERA) was performed in accordance with the eight-step process described in the EPA's "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments", dated 1997.

Chemicals of Concern (COCs) identified for human health during the RFI included VOCs and ammonia in groundwater. For a complete list of COCs, see Table 1. No COCs were identified for soil. No cancer risks or non-

cancer hazards were estimated for current receptors to groundwater because of the lack of exposure pathways for any current use at the site. A PRE using the most recent groundwater data showed that assuming future use of groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated excess lifetime cancer risk for the hypothetical future resident was determined to be 43.85 in 1,000,000, which is within EPA's acceptable range of 1 in a million to 1 in 10,000 but exceeds FDEP's acceptable level of 1 in a million. The main contaminant contributing to this cancer risk was vinyl chloride. The non-cancer hazard index (HI) for the future hypothetical resident was estimated to be 4.6, which is above the EPA and FDEP acceptable threshold of 1.0. The main contaminants contributing to the HI was ammonia. The regulatory standards for ammonia are based on secondary maximum contaminant levels.

The ERA did not identify any unacceptable ecological risks.

WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?

The remedial action objective (RAO) is to protect humans from exposure to groundwater by preventing its use as a drinking water source in the shallow aquifer where contaminant concentrations are higher than regulatory standards. Table 1 lists the COCs present in groundwater at the RRLF. The first column lists the chemical name, the second column lists the range of concentrations in groundwater detected at the RRLF during the RFI, and the last column presents the FDEP/EPA cleanup target level to be achieved at the site.

Table 1

Site-Related Chemicals of Concern (COCs)	Range of Detections ¹ (µg/L)	Site-Specific Cleanup Level ² (µg/L)
Benzene	0.89-3.5	1
Chlorobenzene	422	100
Trichloroethene	3.6	3
Vinyl chloride	0.8-32	1
Ammonia	2,900-13,000	2,800

¹ Detections in monitoring wells

² Cleanup levels are GCTLs from Florida Administrative Code 62-777

REMEDIAL ALTERNATIVES FOR THE RANSOM ROAD LANDFILL

Because of the low levels of groundwater contamination present at the Ransom Road Landfill only one remedy was considered for the site.

Land Use Controls and Natural Attenuation with Long-Term Monitoring: Under this alternative, natural processes such as biological degradation, dispersion, advection, and adsorption will reduce COC concentrations to cleanup levels over time. Groundwater will be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations. Data collected during the RFI indicated that natural attenuation mechanisms will likely reduce contaminant concentrations below cleanup levels within five years. In the long term, this alternative will meet RAOs and will also allow re-evaluation to determine if the remedy is working and provide an opportunity

for change if necessary. In addition, institutional controls will be implemented for site groundwater. The institutional controls will limit the use of groundwater as a drinking water source. NASA, EPA and FDEP have entered into a Memorandum of Agreement (MOA), which outlines how institutional controls will be managed at NASA.² The MOA requires periodic inspections, condition certification, and agency notification. The area of the site that will be under institutional control is shown on Figure 2.

EVALUATION OF REMEDY

The selected remedy was evaluated to determine if it will comply with EPA's four threshold criteria for corrective measures. The four threshold criteria for corrective measures are:

- overall protection of human health and the environment;
- attain media cleanup standards;
- control the sources of releases; and
- comply with standards for management of wastes.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

Land Use Controls and Natural Attenuation with Long-Term Monitoring meet each of the threshold criteria and was determined by the KSC Remediation Team to be the best overall approach.

WHAT IMPACTS WOULD THE REMEDY HAVE ON THE LOCAL COMMUNITY?

There would be no impacts to the local community because groundwater is not used for potable water at KSC. The natural attenuation and long-term monitoring alternative includes administrative actions (i.e. land use controls) to limit the use of groundwater until the cleanup levels have been reached.

WHY DOES THE KSC REMEDIATION TEAM RECOMMEND THIS REMEDY?

The team recommends the proposed remedy because the naturally-occurring processes

observed at the site are sufficient for the removal of low concentrations of VOCs. The long-term monitoring will be used to monitor and document reduction in contamination concentrations to the cleanup target levels. The institutional controls will also prevent exposure to contaminants prior to the cleanup levels being achieved. The proposed remedy meets the four general standards for corrective measures and was determined to be the best overall approach.

NEXT STEPS

The KSC Remediation Team will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into KSC's HSWA permit. If the proposed remedy is determined to be appropriate for implementation, then a long term monitoring program will be initiated, and a Land Use Control Implementation Plan will be developed to incorporate the institutional controls at this site.

Figure 1. Location of Ransom Road Landfill on Kennedy Space Center, FL.

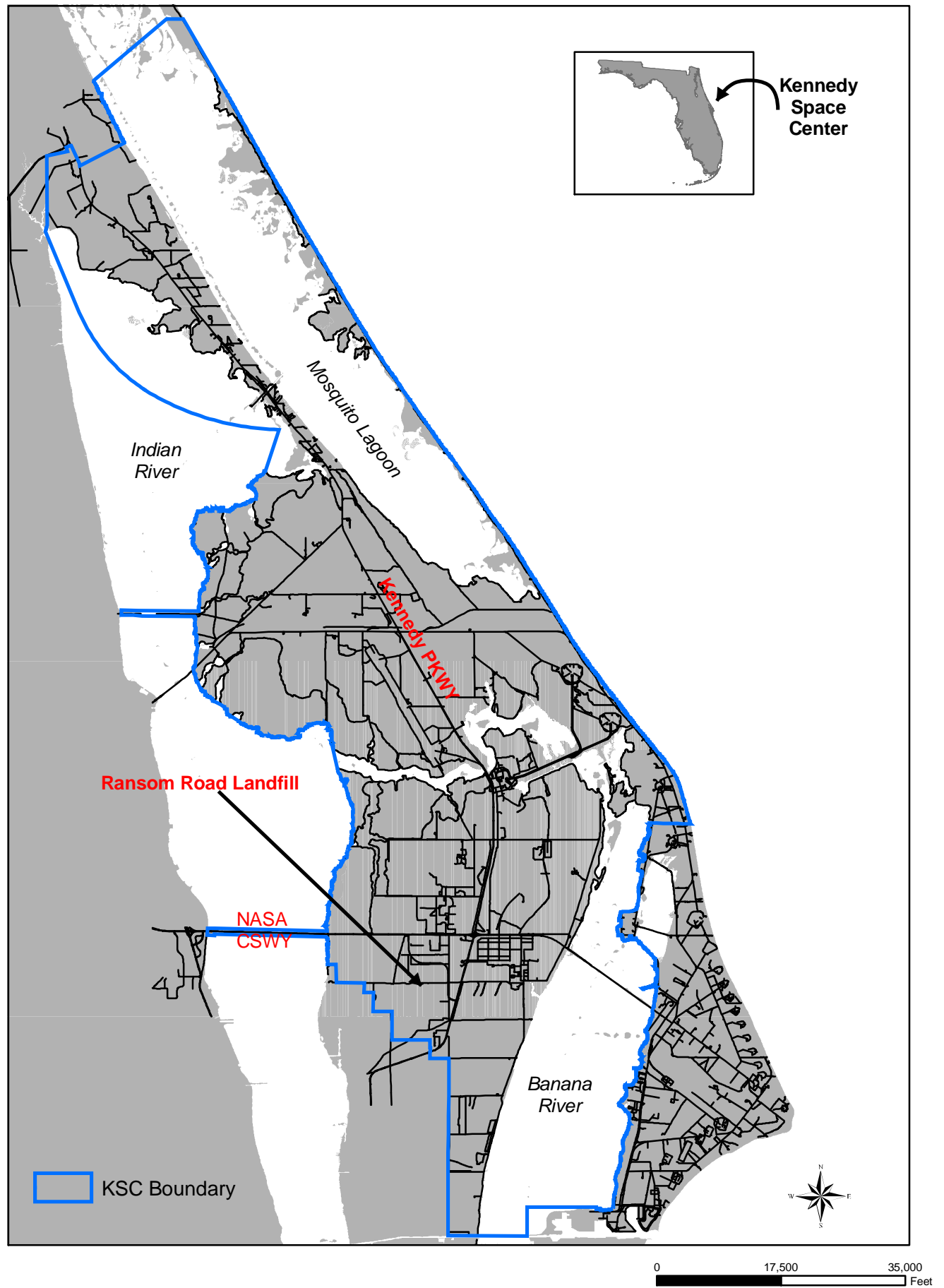


Figure 2. Ransom Road Landfill (SWMU 03) Land Use Control Implementation Plan.

